

REMARKS

Claims 2-42 are present in this application. Claim 8 is an independent claim. Claims 2-7 and 9-32 have been withdrawn. New claim 42 is original claim 1, included for completeness.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Allowable Subject Matter

Applicants thank the Examiner for indicating that claims 35 and 36 contain allowable subject matter.

§ 112, second paragraph, Rejection

Claim 38 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

The Office Action asserts that the term “the two particles” lacks antecedent basis.

Claim 38 has been amended to clarify that “the two particles” consist of two kinds of at least two kinds of particles, thereby providing proper antecedent basis. Applicants request that the rejection be reconsidered and withdrawn based on claim 38 as amended.

§ 102(b) Rejection – Kado

Claims 8, 33, 34, and 37-41 remain rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,731,598 (Kado). Applicants respectfully traverse this rejection.

Embodiments of the present invention covered by claim 8 (e.g., Figs. 9 and 10; Specification at para. 0298 to 0305) are directed to a memory in which at least two memory cells (M1, M2, etc.) each including a resistance-changing function body (e.g. Fig. 1: 113; 904/905, 1004, 1014, 1024) and arranged in a direction parallel to a substrate (para. 0298; 900).

Further, according to the present specification, “Drain regions 903 and 903 of the memory cells M2 and M3 are isolated apart in the transverse direction, and one memory function body 904 (same as the foregoing particle container 113) and one bit contact 901 are formed over

those drain regions 903 and 903. That is, the memory function body 904 is formed integrally continuously in the transverse direction so as to be in contact with the two drain regions 903 and 903." (Specification at para. 0298).

This feature is covered by the claim as objects made of the first substance of memory cells mutually adjacent in the direction parallel to the substrate are integrally continuously formed.

In other words, claim 8 covers the feature that objects of respective two adjacent memory cells are integral and continuous.

Regarding the feature of "at least two memory cells," the Examiner states that,

"Kado ([column 6] lines 27-31) teaches where multiple devices are fabricated in a process that includes the patterning of the multiple tunnel junction layer (6). Hence the limitation "at least two memory cells" is inherently disclosed."

Column 6, lines 27-31, discloses forming of the multiple tunnel junction layer 6. The section relied on by the Examiner states,

"The resultant multiple tunnel junction layer 6 is patterned into islands, and then conductive films (a 50 nm-thick chrome film and a 0.1 μ m-thick Au film, for example) are formed by vacuum evaporation, for example, to cover the multiple tunnel junction layer 6. Then, the source electrode 2 and the drain electrode 3 are formed by normal photolithographic and etching techniques. The distance between the source electrode 2 and the drain electrode 3 is 1 μ m. Thus, the single electron tunnel device as shown in FIG. 1 is obtained."

It is Applicants understanding that the patterning of the multiple tunnel junction layer 6 into islands is performed to form multiple devices. It is Applicants understanding that a single device, such as that shown in Fig. 1, has one island. Subsequently, the at least two memory cells, alleged as being inherent in Kado, would be two of the devices shown in Fig. 1. In other words, it is Applicants understanding that the alleged two memory cells may inherently be two of the single electron tunnel devices.

With respect to the claimed "integrally continuously formed" objects, the Examiner refers to a section in column 8, lines 5-10, which describes a process of forming the multiple tunnel junction layer 19.

The section at column 8, lines 5-10, refers to Figs. 5A and 5B, and discloses that,

“A multiple tunnel junction layer 19 composed of an SiO₂ film 18 and CdSe particles 17 dispersed therein in a single layer is formed on an insulating substrate 16. The multiple tunnel junction layer 19 is then patterned by electron beam lithography and etching, to obtain strips with a width of 0.1 μm and a length of about 1.5 μm.”

Fig. 5A shows a single one of the resulting strips in a single electron tunnel device.

Claim 8 requires “objects made of the first substance of memory cells mutually adjacent in the direction parallel to the substrate are integrally continuously formed.” In other words, the claim requires objects of adjacent memory cells to be integral and continuous.

Applicants submit that Kado fails to teach or suggest adjacent strips 19 for two adjacent single electron tunnel devices (i.e. memory cells mutually adjacent) being integral and continuous. In particular, as noted in the above section at column 6, the multiple tunnel junction layer is patterned into islands, which by definition are isolated, i.e. not integral and continuous.

Applicants submit that Kado discloses examples of one memory cell (having an associated source electrode and an associated drain electrode), but does not disclose a device having “at least two memory cells.” Furthermore, Applicants submit that Kado does not disclose the claimed feature of “objects made of the first substance of memory cells mutually adjacent in the direction parallel to the substrate are integrally continuously formed.”

For at least these reasons, Applicants submit that Kado fails to teach each and every claimed element. Accordingly, Applicants request that the rejection be reconsidered and withdrawn.

Further with regard to claim 37, Applicants submit that Kado fails to disclose two kinds of particles, which are a relatively small particle and a relatively large particle, at column 8, lines 17 and 18. The section at column 8 merely states, “FIG. 6 schematically shows the distribution in plane of the CdSe particles 17 dispersed in the multiple tunnel junction layer 19.”

Further with regard to claims 33, 34, and 39, the Examiner alleges that the functional limitations do not distinguish the claimed device. Applicants disagree, and submit that the functional language defines a respective structural element. For example, claims 33 and 34 recite “rectifying function body” “for determining a direction of a current that flows through the resistance-changing function body.” Applicants submit that the functional language of “for determining ...” serves to

define what is meant by "rectifying," and should not be ignored. Similarly with respect to claim 39, the functions of "retaining electric charge" and "serving as a barrier" serve to define the material composition of the particles, and should not be ignored.

For at least these additional reasons, Applicants submit that Kado fails to teach or suggest at least the features recited in claims 33, 34, 37, and 39.

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact **Robert Downs** Reg. No. 48,222 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

Dated: April 14, 2008

Respectfully submitted,

By *Robert Downs #48,222*
Terrell C. Birch
Registration No.: 19,382
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant